

# Unit 5 Worksheet 2 Perpendicular Bisectors

State two things that a perpendicular bisector does to a segment.

- PERPENDICULAR TO SEGMENT
- SPLITS SEGMENT INTO 2  $\cong$  SEGMENTS

3. The point at which all perpendicular bisectors meet in a triangle is called the CIRCUMCENTER.

4. Solve for  $r$  and  $q$  if:

$\overline{CD} \perp$  bisector of  $\overline{AB}$

$$BD = 6r + 4$$

$$AD = 22 + 3r$$

$$m\angle CAB = 8q + 17$$

$$m\angle ACD = 10 + q$$

$$22 + 3r = 6r + 4$$

$$22 = 3r + 4$$

$$18 = 3r$$

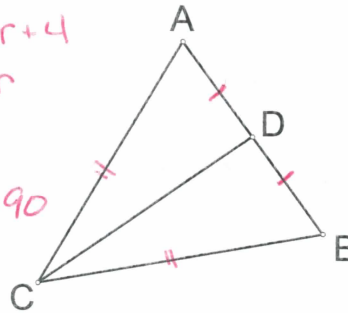
$$6 = r$$

$$(8q + 17) + (10 + q) = 90$$

$$9q + 27 = 90$$

$$9q = 63$$

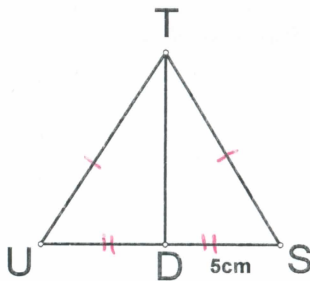
$$q = 7$$



$$r = \underline{6}$$

$$q = \underline{7}$$

5.  $\triangle STU$  is equilateral and  $\overline{TD} \perp$  bisector of  $\overline{SU}$ . Find the missing side lengths.



$$TS = \underline{10 \text{ cm}}$$

$$TU = \underline{10 \text{ cm}}$$

$$SU = \underline{10 \text{ cm}}$$

6. In  $\triangle DEF$ ,  $\overline{GI}$  is a  $\perp$  bisector.

Find  $x$  if  $EH = 16$  and  $FH = 6x - 5$ .

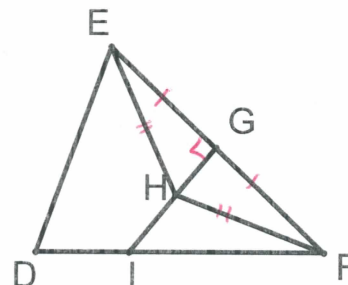
$$x = \underline{3.5}$$

$$EH = FH$$

$$16 = 6x - 5$$

$$21 = 6x$$

$$3.5 = x$$



Find  $y$  if  $EG = 3.2y - 1$  and  $FG = 2y + 5$

$$y = \underline{5}$$

$$EG = FG$$

$$3.2y - 1 = 2y + 5$$

$$1.2y - 1 = 5$$

$$1.2y = 6$$

$$y = 5$$

Find  $z$  if  $m\angle EGH = 12z$ .

$$z = \underline{7.5}$$

$$12z = 90$$

$$z = 7.5$$

7. Solve for the following variables if  $\overline{AK}$ ,  $\overline{AL}$ ,  $\overline{AM}$  are perpendicular bisectors and :

$$RA = 8x + 16$$

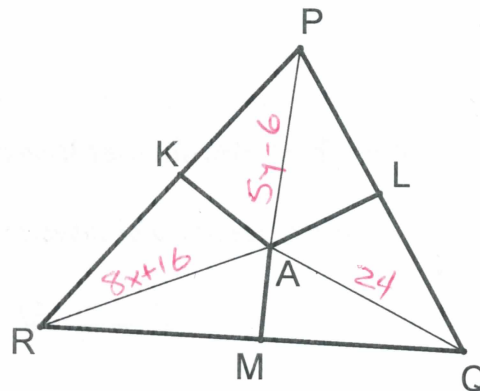
$$PA = 5y - 6$$

$$AQ = 24$$

$$m\angle RMA = 20z$$

$$\begin{aligned} 8x + 16 &= 24 \\ 8x &= 8 \\ x &= 1 \end{aligned} \quad \begin{aligned} 5y - 6 &= 24 \\ 5y &= 30 \\ y &= 6 \end{aligned}$$

$$\begin{aligned} 20z &= 90 \\ z &= 4.5 \end{aligned}$$



$$x = \underline{1}$$

$$y = \underline{6}$$

$$z = \underline{4.5}$$

Use the figure at the right for numbers 8-11.

8.  $\overline{MO}$  is the perpendicular bisector of  $\triangle MPN$  &  $\triangle OPN$ .

9. Find  $MP$ .

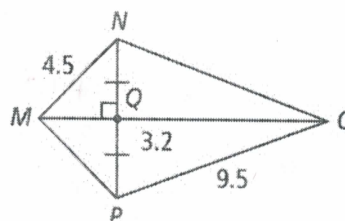
$$4.5$$

10. Find  $NO$ .

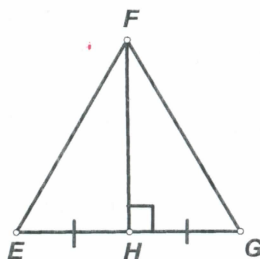
$$9.5$$

11. Find  $NP$ .

$$6.4$$



12. What is the measure of  $x$  if  $\angle FHG = 4x - 6$ ? (Hint: What is the angle equal to in the picture?)

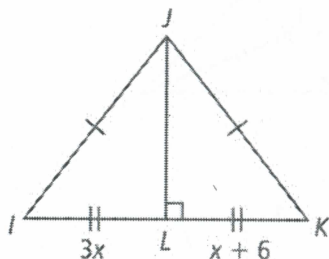


$$\begin{aligned} 4x - 6 &= 90 \\ 4x &= 96 \\ x &= 24 \end{aligned}$$

$$x = \underline{24}$$

For numbers 13 & 14, solve for  $x$ .

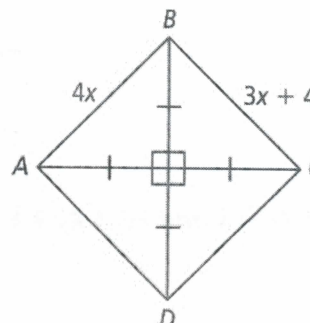
- 13.



$$\begin{aligned} 3x &= x + 6 \\ 2x &= 6 \\ x &= 3 \end{aligned}$$

$$x = \underline{3}$$

- 14.



$$\begin{aligned} 4x &= 3x + 4 \\ x &= 4 \end{aligned}$$

$$x = \underline{4}$$